

Appl. No. : 10/810,660  
Filed : Marych 29, 2004

#### LISTING OF THE CLAIMS

1. (PREVIOUSLY PRESENTED) A pre-release structure configured to form a micro electro mechanical system upon removal of a sacrificial layer through a structure release etch process, said micro electro mechanical system suitable to use on an optical interference display cell, the pre-release structure comprising:

a first electrode;

a second electrode comprising:

a first material layer; and

a conductor layer comprising a light reflective surface facing the first electrode and set directly on the first material layer and approximately in parallel to the first electrode, wherein the first material layer is positioned between the conductor layer and the first electrode;

a sacrificial layer positioned between the first material layer and the first electrode, the sacrificial layer selected from the group consisting of dielectric material, metal material, and silicon material; and

a supporter configured to separate the first electrode from the first material layer to form a cavity upon structure release etching;

wherein the conductor layer is susceptible to etching by an etchant suitable to remove the sacrificial layer and wherein the first material layer is adapted to protect the second electrode from etching when the sacrificial layer is removed using the etchant

wherein the optical interference display cell formed after removal of the sacrificial layer is configured to interferometrically reflect light entering the cavity and contacting the light reflective surface.

2. (PREVIOUSLY PRESENTED) The pre-release structure of claim 1, wherein the material of the sacrificial layer is selected from the group consisting of metal material or silicon material.

3. (PREVIOUSLY PRESENTED) The pre-release structure of claim 1, further comprising a second material layer covering the second electrode.

4. (PREVIOUSLY PRESENTED) A structure of a micro electro mechanical system comprising:

a first electrode;

a second electrode comprising:

a first material layer; and

a conductor layer set on the first material layer and approximately in parallel to the first electrode; and

a supporter configured to separate the first electrode from the first material layer to form a cavity;

a second material layer set on the second electrode; and

a spacer set on the sidewalls of the second electrode and the first material layer;

wherein the first material layer is adapted to protect the second electrode from etching when a sacrificial layer between the first electrode and the first material layer is removed through a structure release etch process to form the cavity.

5. (PREVIOUSLY PRESENTED) The pre-release structure of claim 1, wherein the material of the first material layer is selected from the group consisting of silicon material, dielectric material, transparent conductor material, macromolecule polymer, metal oxide and any arbitrary combination thereof.

6. (PREVIOUSLY PRESENTED) The pre-release structure of claim 3, wherein the material of the second material layer is selected from the group consisting of silicon material, dielectric material, transparent conductor material, macromolecule polymer, metal oxide and any arbitrary combination thereof.

7. (PREVIOUSLY PRESENTED) The structure of a micro electro mechanical system of claim 4, wherein the material of the spacer is selected from the group consisting of silicon material, dielectric material, transparent conductor material, macromolecule polymer, metal oxide and any arbitrary combination thereof.

8. (PREVIOUSLY PRESENTED) The pre-release structure of claim 5, wherein the first material layer is a silicon material that is poly-silicon or amorphous silicon.

9. (PREVIOUSLY PRESENTED) The pre-release structure of claim 6, wherein the second material layer is a silicon material that is poly-silicon or amorphous silicon.

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10. (PREVIOUSLY PRESENTED) The structure of a micro electro mechanical system of claim 7, wherein the material of the spacer is a silicon material that is poly-silicon or amorphous silicon.

11. (PREVIOUSLY PRESENTED) The pre-release structure of claim 5, wherein the first material layer is a dielectric material that is silicon oxide, silicon nitride, or silicon oxynitride.

12. (PREVIOUSLY PRESENTED) The pre-release structure of claim 6, wherein the second material layer is a dielectric material that is silicon oxide, silicon nitride, or silicon oxynitride.

13. (PREVIOUSLY PRESENTED) The structure of a micro electro mechanical system of claim 7, wherein the material of the spacer is a dielectric material that is silicon oxide, silicon nitride, or silicon oxynitride.

14. (PREVIOUSLY PRESENTED) The pre-release structure of claim 5, wherein the first material layer is a transparent conductor material that is indium tin oxide, indium zinc oxide, or indium oxide.

15. (PREVIOUSLY PRESENTED) The pre-release structure of claim 6, wherein the second material layer is a transparent conductor material that is indium tin oxide, indium zinc oxide, or indium oxide.

16. (PREVIOUSLY PRESENTED) The structure of a micro electro mechanical system of claim 7, wherein the material of the spacer is a transparent conductor material that is indium tin oxide, indium zinc oxide, or indium oxide.

17. (PREVIOUSLY PRESENTED) A structure of a micro electro mechanical system, comprising:

a first electrode;

a second electrode comprising:

a first material layer; and

a conductor layer set on the first material layer and approximately in parallel to the first electrode; and

a supporter configured to separate the first electrode from the first material layer to form a cavity;

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wherein the first material layer is adapted to protect the second electrode from etching when a sacrificial layer between the first electrode and the first material layer is removed through a structure release etch process to form the cavity;

wherein the first material layer is a macromolecule polymer that is paraffin or a macromolecule material that can be coated by vapor.

18. (PREVIOUSLY PRESENTED) A structure of a micro electro mechanical system, comprising:

a first electrode;

a second electrode comprising:

a first material layer; and

a conductor layer set on the first material layer and approximately in parallel to the first electrode;

a supporter configured to separate the first electrode from the first material layer to form a cavity; and

a second material layer covering the second electrode;

wherein the first material layer is adapted to protect the second electrode from etching when a sacrificial layer between the first electrode and the first material layer is removed through a structure release etch process to form the cavity;

wherein the second material layer is a macromolecule polymer that is paraffin or a macromolecule material that can be coated by vapor.

19. (PREVIOUSLY PRESENTED) The structure of a micro electro mechanical system of claim 7, wherein the material of the spacer is a macromolecule polymer that is paraffin or a macromolecule material that can be coated by vapor.

20. (PREVIOUSLY PRESENTED) The pre-release structure of claim 1, wherein the thickness of the first material layer is about several angstroms to 2000 angstrom.

21. (PREVIOUSLY PRESENTED) The pre-release structure of claim 1, wherein the thickness of the first material layer is preferably about 200 angstrom to 1000 angstrom.

22. (PREVIOUSLY PRESENTED) The pre-release structure of claim 3, wherein the thickness of the second material layer is about several angstroms to 2000 angstrom.

23. (PREVIOUSLY PRESENTED) The pre-release structure of claim 3, wherein the thickness of the second material layer is preferably about 200 angstrom to 1000 angstrom.

24. (PREVIOUSLY PRESENTED) The pre-release structure of claim 1, wherein the material forming the supporter is selected from the group consisting of one or more of positive photoresists, negative photoresists, acrylic resins, and epoxy resins.

25. (PREVIOUSLY PRESENTED) The pre-release structure of claim 1, wherein the material of forming the conductor layer is metal material.

26. (PREVIOUSLY PRESENTED) The pre-release structure of claim 1, wherein the second electrode is a movable electrode.

27. (PREVIOUSLY PRESENTED) A pre-release structure configured to form a micro electro mechanical system upon removal of a sacrificial layer through a structure release etch process, said micro electro mechanical system suitable to use on an optical interference display cell, the pre-release structure comprising:

a first electrode;

a second electrode comprising a light reflective surface facing the first electrode and set approximately in parallel to the first electrode;

a material layer directly contacting the light reflective surface;

a sacrificial layer positioned between the material layer and the first electrode, the sacrificial layer selected from the group consisting of dielectric material, metal material, and silicon material; and

a supporter configured to separate the first electrode from the material layer to form a cavity upon structure release etching;

wherein the second electrode is susceptible to etching by an etchant suitable to remove the sacrificial layer and wherein the material layer is adapted to protect the second electrode from etching when the sacrificial layer is removed using the etchant

wherein the optical interference display cell formed after removal of the sacrificial layer is configured to interferometrically reflect light entering the cavity and contacting the light reflective surface.

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28. (PREVIOUSLY PRESENTED) The pre-release structure of claim 27, wherein the material of the sacrificial layer is selected from the group consisting of metal material and silicon material.

29. (PREVIOUSLY PRESENTED) The pre-release structure of claim 27, wherein the material of the material layer is selected from the group consisting of silicon material, dielectric material, transparent conductor material, macromolecule polymer, metal oxide and any arbitrary combination thereof.

30. (PREVIOUSLY PRESENTED) The pre-release structure of claim 29, wherein the material of the material layer is a silicon material that is poly-silicon or amorphous silicon.

31. (PREVIOUSLY PRESENTED) The pre-release structure of claim 29, wherein the material of the material layer is a dielectric material that is silicon oxide, silicon nitride, or silicon oxynitride.

32. (PREVIOUSLY PRESENTED) The pre-release structure of claim 29, wherein the material of the material layer is a transparent conductor material that is indium tin oxide, indium zinc oxide, or indium oxide.

33. (PREVIOUSLY PRESENTED) The pre-release structure of claim 29, wherein the material of the material layer is a macromolecule polymer that is paraffin or a macromolecule material that can be coated by vapor.

34. (PREVIOUSLY PRESENTED) The pre-release structure of claim 27, wherein the thickness of the material layer is about several angstroms to 2000 angstrom.

35. (PREVIOUSLY PRESENTED) The pre-release structure of claim 27, wherein the thickness of the material layer is preferably about 200 angstrom to 1000 angstrom.

36. (PREVIOUSLY PRESENTED) The pre-release structure of claim 27, wherein the material forming the supporter is selected from the group consisting of one or more of positive photoresists, negative photoresists, acrylic resins, and epoxy resins.

37. (PREVIOUSLY PRESENTED) The pre-release structure of claim 27, wherein the second electrode is a movable electrode.

38-73. (CANCELLED)

74. (PREVIOUSLY PRESENTED) The pre-release structure of claim 1, wherein the sacrificial layer is amorphous silicon.

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75. (PREVIOUSLY PRESENTED) The pre-release structure of claim 27, wherein the sacrificial layer is amorphous silicon.